



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

HEENEY et al.

Examiner: Duc Truong

Serial No.: 10/661,812

Group Art Unit: 1711

Filed: September 15, 2003

Title: MONO-, OLIGO- AND POLY(3-ALKYNYLTHIOPHENES) AND THEIR USE
AS CHARGE TRANSPORT MATERIALS

BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the decision of the Examiner finally rejecting claims 1-6, 10, 11, 14 and 15 of the above-identified application.

(1) REAL PARTY IN INTEREST

The application is assigned of record to Merck Patent GmbH, who is the real party in interest herein.

(2) RELATED APPEALS AND INTERFERENCES

Appellants, their legal representative and the assignee are not aware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

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(3) STATUS OF THE CLAIMS

Claims rejected: Claims 1-6, 10, 11, 14 and 15.
Claims allowed: (none)
Claims canceled: (none)
Claims withdrawn: Claims 7-9, 12-13 and 16-27.
Claims on Appeal: Claims 1-6, 10, 11, 14 and 15 (Copy of claims on appeal in attached Appendix).

(4) STATUS OF AMENDMENTS AFTER FINAL

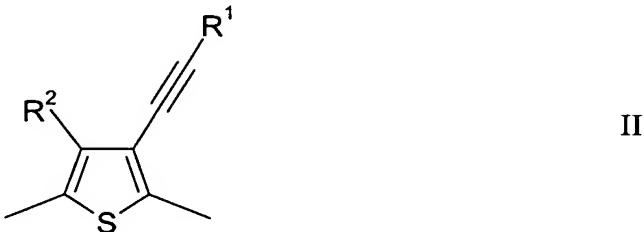
An Amendment After Final Rejection was filed on May 2, 2006, and was entered for purposes of this appeal. It made only non-substantive grammatical changes to claim 1 and 2.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

Appellants' invention is directed to monomers, oligomers and polymers which have as part thereof a grouping of the formula I:



where A and C are each a group of formula II:



and R¹, R², B, D, a, b, c, d, and n, are as defined in claim 1, provided that, when b and d are 0 and R² is H, R¹ is not optionally substituted aryl or heteroaryl and not -SiR⁰R⁰⁰- substituted alkyl. As shown by the variable "n", there may be one unit (monomer) or recurring units (oligomers and polymers). The preferred embodiment of claim 2, on appeal, recites the preferred terminal groups R⁴ and R⁵, where such terminal groups are not so limited in claim 1, on appeal. These materials are particularly useful as semiconductors or charge transport materials and, thus, find application in optical, electrooptical or electronic devices including field effect transistors, electroluminescent, photovoltaic and sensor devices.

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following outstanding grounds of rejection are requested to be reviewed on appeal. For each ground, any separate consideration of the claims subject to that rejection are indicated.

1. The rejection of claims 1-6, 10-11 and 14-15, on appeal, under 35 U.S.C. §112, first paragraph, as failing to have adequate written description in the disclosure. As to this rejection the claims, on appeal, are grouped together.
2. The rejection of claims 1-6, 10, 11 and 14-15, on appeal, under 35 U.S.C. §102(b), as being anticipated by Chem Abstract 135:153178 ("Hayashi") or Chem Abstract 130:197214 ("Salzner"). As to this rejection the claims, on appeal, are grouped together.

(7) APPELLANTS' ARGUMENTS

1. Claims 1-6, 10-11 and 14-15, on appeal, have adequate written description in the disclosure and, thus, the rejection under 35 U.S.C. §112, first paragraph, is not supported.

The rejection is made based on alleged lack of support for the proviso in claim 1 reciting "provided that, when b and d are 0 and R² is H, R¹ is not optionally substituted aryl or heteroaryl and not -SiR⁰R⁰⁰- substituted alkyl."

Appellants respectfully submit that the disclosure provides adequate support for the recited proviso. For example, the disclosure at page 14, paragraph [0035], provides support for the proviso. This part of the disclosure shows that there was a preference for R¹ being an alkyl group which is not -SiR⁰R⁰⁰- substituted and is not an aryl group or heteroaryl group. Although the exact words of the proviso are not recited, such is not required for adequate written description under 35 U.S.C. §112, first paragraph. It is well settled that the subject matter of a claim need not be described in the specification literally or "in verbis" in order for the specification to satisfy the description requirement of 35 U.S.C. §112, first paragraph. See In re Lukach, 169 USPQ 795 (CCPA 1971); Kennecott Corp. v. Kyocera International, Inc., 5 USPQ2d 1194, 1197 (Fed. Cir. 1987); Martin v. Johnson, 172 USPQ 391 (CCPA 1972); and In re Wertheim, 191 USPQ 90, at 98 (CCPA 1976). Here, the specification shows a preference towards the compounds to which the claim is more particularly directed by the proviso. The proviso merely provides a way of describing this preference. Although the words of the proviso

are not contained in the disclosure, the substance of their meaning is conveyed to one of ordinary skill in the art by the disclosure. This is all that is required for adequate description under 35 U.S.C. §112, first paragraph.

See also, Fujikawa v. Wattanasin, 39 USPQ2d 1895, 1904 (Fed. Cir. 1996), supporting that written description is not a strict standard but one applied under reasonableness principles, i.e., the disclosure need only "reasonably convey" to those in the art that the inventors possessed the invention. It is urged that the reasonableness standard is particularly applicable where, as here, the language in question serves to narrow the claim scope, not broaden it. Narrowing of claims has generally given rise to lack of written description rejections only where the narrowing adds an element to the claim, not previously described, or creates a subgenus through extensive selection and combining of multiple variables from a broader generic formula where there was no direction to the particular selection and combining. The instant facts do not fall under either of those scenarios. As argued further below, where it is clear that the inventors possessed the invention as more broadly recited in the original claim, it is also reasonably conveyed to those skilled in the art that the inventors also possessed an invention slightly narrowed in scope from the broader recitation due to the proviso.

Even if it is believed that the disclosure does not indicate the preference embodied in the proviso as discussed above, the prevailing case law supports the acceptability to add a proviso slightly limiting the scope of the claims without the need for any specific disclosure of the proviso in the specification; see, e.g., In re Johnson, 194 USPQ 187 (CCPA 1977). The basis for Johnson, which applies here, is that, since the whole scope of the original genus of claim 1 is clearly supported, a scope which only eliminates a small part of such scope by the proviso must also be supported. Clearly, the applicants are not adding any new matter since the proviso makes the claim narrower. In Johnson, the application described a genus encompassing a large number of species and described a number of specific species. Two of the specifically described species were excluded by proviso. Although there was no description at all in the specification that these two species should be excluded, it was held that the claim reciting the proviso was supported by the disclosure under 35 U.S.C. §112, first paragraph. The principle to be applied here is indistinguishable. The genus is clearly supported by the disclosure, a very limited scope

of species is excluded by the proviso and that limited scope of species is described in the specification (i.e., the specification describes the embodiments of R¹ being optionally substituted aryl or heteroaryl or -SiR⁰R⁰⁰- substituted alkyl, which are now excluded by the proviso). The following statement by the Court in Johnson fully applies here:

"The notion that one who fully discloses, and teaches those skilled in the art how to make and use, a genus and numerous species therewithin, has somehow failed to disclose, and teach those skilled in the art how to make and use, that genus minus two of those species, and thus has failed to satisfy the requirement of §112, first paragraph, appears to result from a hypertechnical application of legalistic prose relating to that provision of the statute."

Thus, since the full genus was described and the embodiments which are excluded by the proviso were described as options for R¹, the specification must support the genus absent such embodiments, i.e., it described all the embodiments as options for R¹, thus it describes all the embodiments absent the excluded ones. For the same reasons supporting the Johnson decision, the proviso recited in claim 1 is not lacking support in the instant disclosure.

For all of the above reasons, it is urged that the rejection under 35 U.S.C. §112, first paragraph, is not supported and should be reversed.

2. Claims 1-6, 10, 11 and 14-15, on appeal, are not anticipated by Chem Abstract 135:153178 ("Hayashi") or Chem Abstract 130:197214 ("Salzner") and, thus, the rejection under 35 U.S.C. §102(b) is not supported.

Hayashi discloses phenylacetylene thiophene compounds or polymers having -C≡C-Ph substituents. The monomers, oligomers or polymers of applicants' formula I of claim 1 do not encompass such compounds. Compare the proviso at the end of claim 1, on appeal -- upon which all other claims on appeal ultimately depend. The claims on appeal exclude compounds and polymers wherein, at the same time, b and d are 0, R² is H, and R¹ is optionally substituted aryl or heteroaryl or -SiR⁰R⁰⁰- substituted alkyl. The Hayashi compounds are specifically excluded by the proviso since the group corresponding to R¹ in Hayashi is an aryl group or -

$\text{SiR}^0\text{R}^{00}$ - substituted alkyl group. Accordingly, Hayashi does not meet all elements of the claims and cannot anticipate the instant claims under 35 U.S.C. §102.

Salzner discloses thiophene compounds having $-\text{C}\equiv\text{C}-\text{H}$ substituents. The monomers, oligomers or polymers of applicants' formula I of claim 1 do not encompass such compounds. Compare the definition of R^1 in the currently amended claim 1 -- upon which all other claims ultimately depend. Salzner fails to disclose compounds or polymer having a thiophene ring with a $-\text{C}\equiv\text{C}-\text{R}^1$ substituent wherein R^1 is as defined in claim 1, on appeal, which definition does not include hydrogen. Thus, Salzner does not meet all elements of the claims and cannot anticipate the instant claims under 35 U.S.C. §102.

The Final Office Action states that appellants gave no details of why the claims were distinguished from the prior art in their previous traversal of the 35 U.S.C. §102 rejection. To the contrary, appellants clearly pointed out that the compounds disclosed in the references were excluded by the proviso previously added to claim 1 and the definition of R^1 therein. Appellants' arguments on this point appear to have not been given any weight or consideration. To the extent that these arguments were not given any weight or consideration because of the alleged lack of written description of the proviso discussed above, appellants respectfully submit that such practice is improper. Claim limitations, such as the proviso herein, subject to a rejection under 35 U.S.C. §112 cannot be ignored when considering application of prior art to the claims. The 35 U.S.C. §112 and §102 issues should be separately considered.

For the above reasons, it is urged that the rejections of the claims on appeal under 35 U.S.C. §102(b) are not supported and should be reversed.

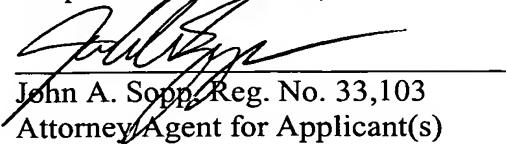
Further, the Hayashi and Salzner references would not support a rejection under 35 U.S.C. §103. The abstracts indicate no utility for the compounds disclosed therein. Where a reference discloses no utility for compounds disclosed therein, the reference provides no motivation to one of ordinary skill in the art to modify such compounds. In re Stemniski, 170 USPQ 343 (CCPA 1971).

(8) CONCLUSION

For all of the above reasons, it is urged that the decision of the Examiner rejecting claims 1-6, 10, 11, 14 and 15, on appeal, is in error and should be reversed.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,


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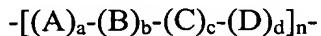
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APPENDIX OF CLAIMS ON APPEAL

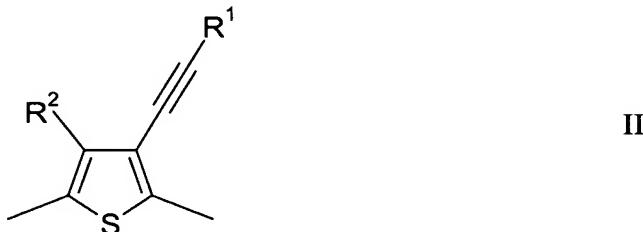
1. A monomer, oligomer or polymer of formula I



I

wherein

A and C denote independently of each other a group of formula II



R¹ is, in each occurrence independently of one another, halogen, or straight chain, branched or cyclic alkyl with 1 to 20 C-atoms, which is unsubstituted, mono- or poly-substituted by F, Cl, Br, I or CN, wherein one or more non-adjacent CH₂ groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, -NR⁰-, -SiR⁰R⁰⁰-, -CO-, -COO-, -OCO-, -OCO-O-, -SO₂-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another, or R¹ is optionally substituted aryl or heteroaryl or P-Sp-,

R² has one of the meanings of R¹ or is H or -C≡C-R³,

R³ has one of the meanings of R¹ or is H,

R⁰ and R⁰⁰ are independently of each other H or alkyl with 1 to 12 C-atoms,

P is a polymerizable or reactive group,

Sp is a spacer group or a single bond,

B and D are independently of each other -CX¹=CX²-, -C≡C-, or optionally substituted arylene or heteroarylene,

X¹ and X² are independently of each other H, F, Cl or CN,

a, b, c, d are independently of each other 0 or 1, with a + b + c + d > 0, and wherein in at least one recurring unit [(A)_a-(B)_b-(C)_c-(D)_d] at least one of a and c is 1, and

n is an integer ≥ 1,

and wherein the recurring units [(A)_a-(B)_b-(C)_c-(D)_d] are identical or different,

provided that, when b and d are 0 and R² is H, R¹ is not optionally substituted aryl or heteroaryl and not -SiR⁰R⁰⁰- substituted alkyl.

2. A monomer, oligomer or polymer according to claim 1, which is of formula I1



wherein A, B, C, D, a, b, c, d and n are as defined in formula I,

R⁴ and R⁵ have, independently of each other, one of the meanings of R¹, or are H, B(OR')(OR'') or SnR⁰R⁰⁰R⁰⁰⁰,

R⁰⁻⁰⁰⁰ are independently of each other H or alkyl with 1 to 12 C-atoms, and

R' and R'' are independently of each other H or alkyl with 1 to 12 C-atoms, or OR' and OR'' together with the boron atom form a cyclic group having 2 to 10 C atoms.

3. A monomer, oligomer or polymer according to claim 1, wherein n is an integer from 1 to 5000.

4. A monomer, oligomer or polymer according to claim 2, wherein n is an integer from 1 to 5000.

5. A monomer, oligomer or polymer according to claim 1, wherein R¹, R² and/or R³ are selected from C₁-C₂₀-alkyl that is optionally substituted with one or more fluorine atoms, C₁-C₂₀-alkenyl, C₁-C₂₀-alkynyl, C₁-C₂₀-alkoxy, C₁-C₂₀-thioether, C₁-C₂₀-silyl, C₁-C₂₀-ester, C₁-C₂₀-amino, C₁-C₂₀-fluoroalkyl, or optionally substituted aryl or heteroaryl.

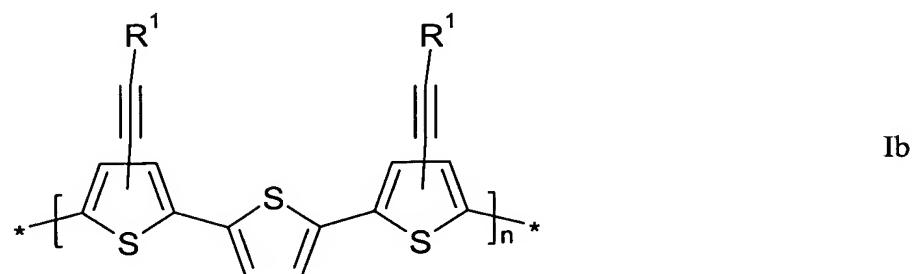
6. A monomer, oligomer or polymer according to claim 2, wherein R¹, R² and/or R³ are selected from C₁-C₂₀-alkyl that is optionally substituted with one or more fluorine atoms, C₁-C₂₀-alkenyl, C₁-C₂₀-alkynyl, C₁-C₂₀-alkoxy, C₁-C₂₀-thioether, C₁-C₂₀-silyl, C₁-C₂₀-ester, C₁-C₂₀-amino,

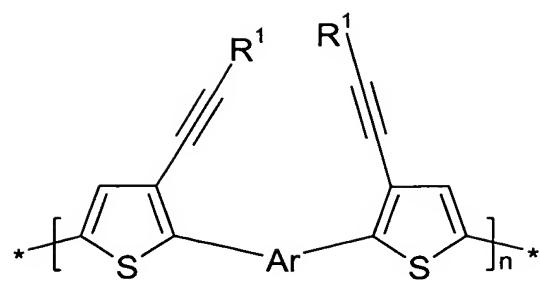
C₁-C₂₀-fluoroalkyl, or optionally substituted aryl or heteroaryl.

10. An oligomer or polymer according to claim 1, wherein n is an integer from 2 to 5000.

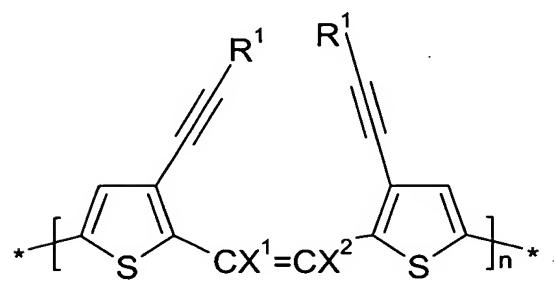
11. An oligomer or polymer according to claim 2, wherein n is an integer from 2 to 5000.

14. A monomer, oligomer or polymer according to claim 1, wherein -[(A)_a-(B)_b-(C)_c-(D)_d]- is selected from the following formulae

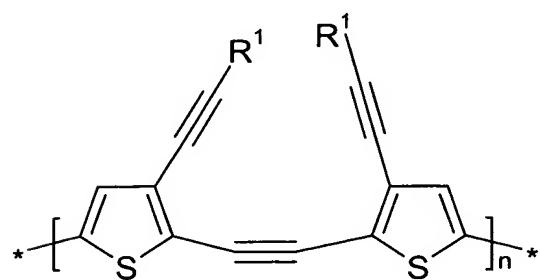




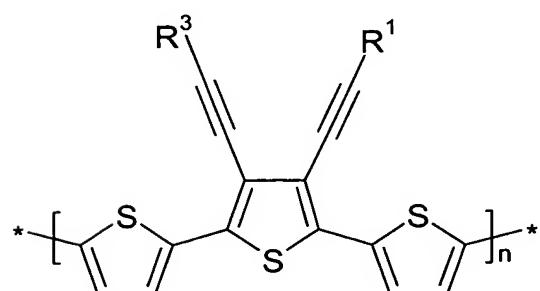
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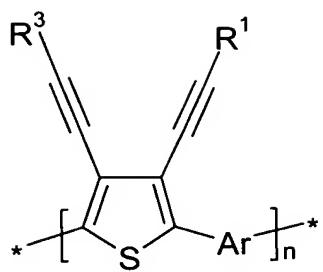
Id



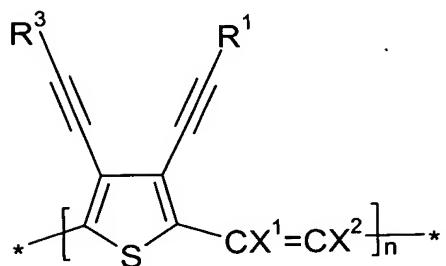
Ie



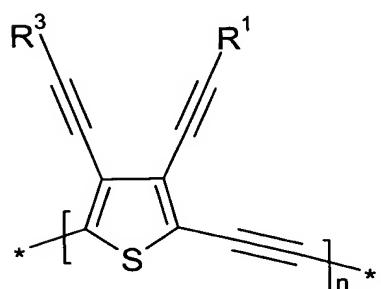
If



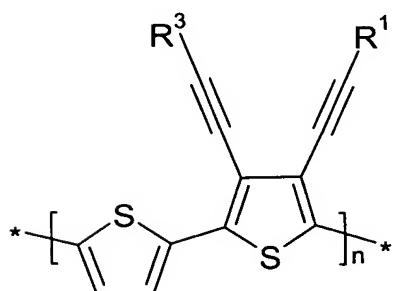
Ig



Ih



Ii



Ik

wherein R¹, R³, X¹ and X² have the meanings given in formula I, Ar is arylene or

heteroarylene which in each case is optionally substituted by one or more groups R¹ as defined in formula I, and n is an integer from 1 to 5000.

15. A polymer according to claim 1, wherein the polymer has a regioregularity of from 90 to 100%.

EVIDENCE APPENDIX

[none]